

Claims

1. A computerized system for automatic packaging determination, comprising:
 - at least one processor; and
 - at least one non-transitory storage medium comprising instructions that, when executed by the at least one processor, cause the at least one processor to perform steps comprising:
 - receiving, from a remote system, an order comprising at least one item;
 - searching at least one data store to determine one or more tags and one or more properties associated with the at least one item;
 - based on the determined one or more tags and a number of items in the order, sorting the at least one item into at least one group;
 - determining if at least one group from the sorted groups is associated with a fragile tag;
 - iteratively simulating packaging of the at least one group associated with the fragile tag into a single package;
 - based on determining that the items associated with the at least one group associated with the fragile tag will not fit into a single package, sorting the items into multiple groups by:
 - modifying a variable representing a number of groups to represent an additional group;
 - dividing the items associated with the fragile tag into the at least one group associated with the fragile tag and the additional group; and
 - iteratively simulating packaging of the items associated with the fragile tag into multiple packages; and
 - performing an optimization process for packaging the items in the at least one group not associated with the fragile tag, by:

selecting a data structure representing a first package, the data structure comprising properties of the first package;
iteratively simulating packaging of a largest item of the group into the first package until all items are packaged in the first package, wherein if the simulating determines that the items in the group do not fit into the first package:

choosing a larger package, and
iteratively computationally packing the largest item until all items are packed in the larger package; and
generating at least one set of instructions, based on the simulating, for packaging the items into a selected package, wherein the selected package comprises the first package or the larger package; and

sending the generated at least one set of instructions to a computer system for display, the instructions including at least one item identifier and one package identifier.

2. The system of claim 1, wherein the one or more tags further include standalone item or normal item.
3. The system of claim 2, wherein the steps further comprise:
determining that the received order comprises at least one item associated with a standalone tag;
sorting the at least one item associated with the standalone tag into at least one respective group;
sorting at least one remaining item into one or more groups.
4. The system of claim 1, wherein the steps further comprise:

determining that the variable representing a number of groups is larger than the number of items associated with the fragile tag; and based on the determination, assigning a standalone tag to each of the items associated with the fragile tag.

5. The system of claim 1, wherein the steps further comprise:
 - determining that a first subset of the items associated with the fragile tag can be fit into a first package;
 - determining that a second subset of the items associated with the fragile tag cannot be fit into any available package;
 - increasing the variable representing a number of groups; and
 - iteratively simulating packaging of the second subset of items associated with the fragile tag into multiple packages.
6. The system of claim 1, wherein performing the optimization process optimizes for packaging and shipping cost.
7. The system of claim 1, wherein iteratively simulating packaging further comprises:
 - determining dimensions of the at least one item of the group;
 - determining the largest item of the group based on determining an item with a longest dimension;
 - simulating packing the largest item into the first package;
 - calculating remaining spaces based by subtracting the dimensions of the largest item from the dimensions of the first package; and
 - iteratively simulating packing at least one remaining item in the group into the calculated remaining spaces.
8. The system of claim 1, wherein the properties associated with each item comprise weight or dimensions.
9. The system of claim 8, wherein sorting the items into at least one group comprises optimizing over a first threshold associated with dimensions and a second threshold associated with weight.

10. A computer-implemented method for automatic packaging determination comprising:

- receiving an order comprising at least one item;
- searching at least one data store to determine one or more tags and one or more properties associated with the at least one item;
- based on the determined one or more tags and a number of items in the order, sorting the at least one item into at least one group;
- determining if at least one group from the sorted groups is associated with a fragile tag;
- iteratively simulating packaging of the at least one group associated with the fragile tag into a single package;
- based on determining that the items associated with the at least one group associated with the fragile tag will not fit into a single package, sorting the items into multiple groups by:
- modifying a variable representing a number of groups to represent an additional group;
- dividing the items associated with the fragile tag into the at least one group associated with the fragile tag and the additional group; and
- iteratively simulating packaging of the items associated with the fragile tag into multiple packages; and
- performing an optimization process for packaging the items in the at least one group not associated with the fragile tag, by:
 - selecting a data structure representing a first package, the data structure comprising properties of the first package;
 - iteratively simulating packaging of a largest item of the group into the first package until all items are packaged in the first package, wherein if the simulating determines that the items in the group do not fit into the first package:
 - choosing a larger package, and
 - iteratively computationally packing the largest item until all items are packed in the larger package; and
 - generating at least one set of instructions, based on the simulating, for packaging the items into a selected package,

wherein the selected package comprises the first package or the larger package; and
sending the generated at least one set of instructions to a computer system for display, the instructions including at least one item identifier and one package identifier.

11. The computer-implemented method of claim 10, wherein the one or more tags further include standalone item or normal item.
12. The computer-implemented method of claim 11, further comprise:
determining that the received order comprises at least one item associated with a standalone tag;
sorting the at least one item associated with the standalone tag into at least one respective group;
sorting at least one remaining item into one or more groups.
13. The computer-implemented method of claim 10, further comprise:
determining that the variable representing a number of groups is larger than the number of items associated with the fragile tag; and
based on the determination, assigning a standalone tag to each of the items associated with the fragile tag.
14. The computer-implemented method of claim 10, further comprise:
determining that a first subset of the items associated with the fragile tag can be fit into a first package;
determining that a second subset of the items associated with the fragile tag cannot be fit into any available package;
increasing the variable representing a number of groups; and
iteratively simulating packaging of the second subset of items associated with the fragile tag into multiple packages.
15. The computer-implemented method of claim 10, further comprise:
determining dimensions of the at least one item of the group;

determining the largest item of the group based on determining an item with a longest dimension;
simulating packing the largest item into the first package;
calculating remaining spaces based by subtracting the dimensions of the largest item from the dimensions of the first package; and
iteratively simulating packing at least one remaining item in the group into the calculated remaining spaces.

16. The computer-implemented method of claim 10, wherein the properties associated with each item comprise weight or dimensions.
17. The computer-implemented method of claim 16, wherein sorting the items into at least one group comprises optimizing over a first threshold associated with dimensions and a second threshold associated with weight.
18. A computer-implemented system for automatic packaging determination comprising:
 - at least one processor; and
 - at least one non-transitory storage medium comprising instructions that, when executed by the at least one processor, cause the at least one processor to perform steps comprising:
 - receiving, from a remote system, an order comprising at least one item;
 - determining that the received order comprises at least one item associated with a fragile tag;
 - iteratively simulating packaging of the items associated with the fragile tag into a single package;
 - based on determining that the items associated with the fragile tag will not fit into a single package, sorting the items into multiple groups by:
 - modifying a variable representing a number of groups to represent two groups;
 - dividing the items associated with the fragile tag into two groups; and

iteratively simulating packaging of the items
associated with the fragile tag into two
packages; and
performing an optimization process for packaging the
items not associated with the fragile tag, by:
selecting a data structure representing a first
package, the data structure comprising
properties of the first package;
iteratively simulating packaging of a largest item of
the group into the first package until all
items are packaged in a selected package,
wherein if the simulating determines that the
items in the group do not fit into the
selected package:
choosing a larger package, and
iteratively computationally packing the
largest item until all items are packed
in the larger package; and
generating at least one set of instructions for
packaging the items; and
sending the generated at least one set of instructions to a
computer system for display, the instructions
including at least one item identifier and one
package identifier.

19. The computer-implemented method of claim 10, wherein performing the optimization process optimizes for packaging and shipping cost.

20. The computer-implemented system of claim 18, wherein performing the optimization process optimizes for packaging and shipping cost.